

ABSTRACT

An imaging system for reducing aberrations from an intervening medium, and an associated method of use are provided. The system may be an optical or task-based optical imaging system including optics, such as a phase mask, for imaging a wavefront of the system to an intermediate image and modifying phase of the wavefront such that an optical transfer function of the system is substantially invariant to focus-related aberrations from the medium. A detector detects the intermediate image, which is further processed by a decoder, removing phase effects from the optics and forming a final image substantially clear of the aberrations. Other systems may employ an encoder that codes wavefronts of acoustical waves propagating through a medium to make the wavefronts substantially invariant to acoustical aberrations from the medium. Imaging and decoding of the wavefronts reverse effects of the wavefront coding and produce sounds substantially free of the aberrations.